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**Citation for published version:**

Rommerskirchen, C 2015, 'Research note: Fiscal rules, fiscal outcomes and financial market behaviour', *European Journal of Political Research*, vol. 54, no. 4, pp. 836-847. <https://doi.org/10.1111/1475-6765.12112>

**Digital Object Identifier (DOI):**

[10.1111/1475-6765.12112](https://doi.org/10.1111/1475-6765.12112)

**Link:**

[Link to publication record in Edinburgh Research Explorer](#)

**Document Version:**

Peer reviewed version

**Published In:**

European Journal of Political Research

**Publisher Rights Statement:**

This is an accepted version of the paper Rommerskirchen, C. (2015), Fiscal rules, fiscal outcomes and financial market behaviour. *European Journal of Political Research*, 54: 836–847. Available from Wiley On-line here: [doi:10.1111/1475-6765.12112](https://doi.org/10.1111/1475-6765.12112)

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## **Research note: Fiscal rules, fiscal outcomes and financial market behaviour**

Charlotte Rommerskirchen, University of Edinburgh

### **Abstract**

Since the outbreak of Eurozone's Sovereign Debt Crisis, a range of fiscal policy measures have been adopted at the European Union (EU) and national levels which have given rise to claims of a significant reinforcement of fiscal policy constraint. Given the prominence and reinvigorated political appeal of fiscal rules in the EU and beyond, it is disconcerting how little we actually know about the link between fiscal rules, budgetary outcomes and market behaviour. In this research note we aim to take stock of the existing literature and challenge its contribution to the current policy-debate on the merits of fiscal rules. Specifically we will focus on problems linked to endogeneity, measurements and contextuality.

**Keywords:** Fiscal rules, bond markets, fiscal policy, EMU

## 1. Introduction

The European Sovereign Debt Crisis, erupting in 2009, has sparked a host of measures aimed at mitigating the fallout from soaring sovereign bond yields for peripheral Eurozone Member States and the risks of contagion across the currency bloc. Key policies range from the establishment of European emergency credit lines to the European Central Bank's (ECB) unconventional policy measures and ultimately the forceful statement by Mario Draghi, that the ECB would do whatever it takes to save the single currency (and arguably its current membership). Alongside these emergency measures policy-makers at the national and European Union (EU) level, spearheaded by the German government, have lobbied for the reform of fiscal rules to achieve and maintain fiscal sustainability, and thereby calm financial markets. From 2010 to 2012 the German government pressed other Member States to adopt balanced budget laws modelled after its debt brake, the *Schuldenbremse*. With the Fiscal Compact participating Member States pledged to create 'German style' debt brakes by 2014. The promotion of fiscal rules as a cure to the Eurozone's woes has not been affected by the growing consensus that neither the financial crisis of 2008 nor the Sovereign Debt Crisis can be cast as a cautionary tale of fiscal intemperance (Buti and Carnot 2012: 903).

Although the reform of existing fiscal rules and the creation of new budgetary constraints is noteworthy, the promotion of rule-based fiscal policy making and coordination in the EU is not a new phenomenon. Kydland and Prescott's famous dictum 'rules rather than discretion' (1977) guided the architectural design of Economic and Monetary Union (EMU) since the early 1990s. Given the prominence and reinvigorated political appeal of fiscal rules in the EU and beyond, it is disconcerting how little we actually know about the link between fiscal rules, budgetary outcomes and market behaviour. Much of our understanding about possible links is based on empirical work whose data, methods and generalisability are open to question. In this research

note we aim to take stock of the existing literature and question its contribution to the current policy-debate. Specifically we will focus on problems linked to endogeneity, measurements and contextuality. Endogeneity concerns the problem that one cannot conclude from fiscal rules to certain outcomes, be it balanced budgets or bond yields. Measurement concerns the problem that the operationalisation of fiscal rules frequently fails to distinguish between *de jure* and *de facto* fiscal rules. Context-conditionality concerns the problem in N-country studies or comparisons over time, that it is the comparative or evolving context that drives the putative effect of fiscal rules on bond yields, not the rules as such. Before reviewing these three issues, the following section will take stock of the arguments underpinning the alleged relationship from fiscal rules to budgetary outcomes to market reactions.

### *2.1. From fiscal rules to financial market behaviour*

A fiscal rule can be defined as ‘[a] permanent constraint on fiscal policy, typically defined in terms of an indicator of overall fiscal performance’ (Kopits and Symansky 1998: 2). Within the canon of fiscal rules, none has been subject to as much scrutiny as the Stability and Growth Pact (SGP), a EU-level obligation that sets deficit and debt level ceilings of 3 and 60 per cent respectively (Debrun *et al.* 2008). The weak compliance with the SGP has given rise to calls for increased ‘ownership’ of fiscal rules as the national level (Buti and Carnot 2012) and the incorporation of fiscal restraints into domestic law under the Fiscal Compact. Domestic fiscal rules, so the underlying assumption goes, are more effective than supranational ones (Marneffe *et al.* 2011). Empirically, the impact of national fiscal rules has been analysed in several regional contexts: for the US (e.g. Poterba 1995), for the EU (e.g. Bergman *et al.* 2013) and for developing countries (e.g. Tapsoba 2012). Overall, this literature is moderately optimistic that fiscal rules lead to an improvement in the budgetary position, although there remains some doubt (Calmfors and Wren-Lewis 2011). A related body of literature takes the whole budgetary

procedure into account. Various studies have confirmed the effectiveness of *specific* budgetary procedures in improving fiscal performance (notably Hallerberg *et al.* 2009). The link between fiscal rules and financial market behaviour (and thus yields on sovereign debt) is based on the assumed impact of fiscal rules on fiscal policy outcomes. Markets react positively to strict fiscal rules, so the argument goes, because they help to resolve deficit and debt biases of contemporary public finances.

## 2.2. *Empirical literature*

Few studies have built on the budgetary impact of fiscal rules to investigate the relationship between fiscal rules and financial market behaviour. This empirical blind spot comes as a surprise, especially in the context of post-crisis Europe where institutional reform has been welcomed, if not justified, by pointing to its calming effect of market forces. Hallerberg and Wolff (2008) pioneered the study of fiscal institutions and financial markets. Analysing the default risk premia of ten of the original twelve Eurozone Member States from 1993-2005, the authors show that better fiscal institutions are connected with lower risk premia. The authors built on the fiscal governance literature and argue that markets reward the institutional framework in which budgetary processes are embedded if those processes fit the expected form of 'ideal' fiscal governance. Using the European Commission's publicly available Fiscal Rules Index (FRI), Iara and Wolff (2010) show that stronger fiscal rules in Eurozone Member State reduce sovereign risk using a panel of 10 original Eurozone Member States from 1999-2009. This summary index contains information on the quantitative extent to which a country's fiscal policy is restricted by the numerical rules in addition to qualitative characteristics of the individual rules (legal framework, nature of the bodies in charge of monitoring and enforcement, enforcement mechanisms and media visibility). Iara and Wolff conclude that the stronger the legal basis of the rules and the mechanisms of enforcement, the greater the

decrease in risk premia. Heinemann *et al.* (2014) also rely on the European Commission's FRI in their analysis of the impact of fiscal rules on monthly risk premia for a panel of 16 EU Member States over the 1993-2008 period. The authors show that although fiscal rules generally do not have an impact on bond yields, stronger fiscal rules in high debt countries limit yield increases. In their analysis on fiscal rules at the sub-national level in Switzerland, Feld *et al.* (2013) create an index of cantonal fiscal rules comprising 1) the connection of budget planning with actual budget execution; 2) the numerical constraint; and 3) the sanctioning mechanism in the form of automatic tax adjustments. Examining 288 tradable Swiss bonds in the period from 1981 to 2007 the authors find that both the presence and the strength of fiscal rules contribute significantly to lower cantonal bond spreads.

These four investigations have their merits, yet, as we argue, they do not present sufficiently strong evidence as to give empirical support for the promotion of new fiscal rules across Europe. Indeed, the results of all four studies reviewed are questionable on the grounds that they fail to fully consider the three problems discussed in this article; endogeneity, measurement and context-conditionality. To be clear, our critique here does not amount to the reverse argument, namely that markets do not care about, or even dislike fiscal rules. We simply argue that the empirical evidence presented so far does not provide us with strong enough results to inform public policy. The following sections will review the, in our option, main shortcomings of the existing literature.

### **3. The endogeneity of fiscal rules**

Empirically modelling the impact of fiscal rules on public finances/sovereign risk throws up the challenge of endogeneity. Put simply, endogeneity concerns the problem that one cannot conclude from fiscal rules to certain outcomes, be it budget balances or bond yields. The most

frequent form of endogeneity concerns the line of causation, which may run the other way round. A second usual suspect for endogeneity relates to the omission of an important explanatory variable (omitted variable bias). Endogeneity renders estimators inconsistent and is thus a serious challenge to econometric results. For qualitative research investigating causal relationships, the logic of endogeneity applies and is worth considering outside of statistical modelling.

The existing literature supposes that financial market participants reward fiscal rules with better financing conditions for sovereign debt. The allegedly positive effect of a(n improved) fiscal rule has been interpreted as investors' approval of strict fiscal frameworks or even investors' wish for austerity politics. Yet we actually know very little about whether and, if so, how bond investors evaluate fiscal rules. In Mosley's (2003) account on the decisions of international bond investors, 'fiscal frameworks/rules' does not appear as an evaluation category. Not only for academics, but also for policy-makers there is a substantial amount of uncertainty: Martin Wolf critically summarised the political situation as 'giving the markets what we think they may want in future – even though they show little sign of insisting on it now' (*Financial Times* 27.5.2010). Austerity politics tend to be presented as the forced policy of a state that has become a residual authority wedged between financial market pressure and the conditionality of EU financial assistance. Yet markets do not necessarily reward austerity measures. As the former IMF Chief Economist Oliver Blanchard (2012) put it, 'financial investors are schizophrenic [...]. They react positively to news of fiscal consolidation, but then react negatively later, when consolidation leads to lower growth.'

### 3.1. Omitted variable bias

Fiscal rules and sovereign risk may both respond to other unobserved variables related to other political factors. A positive effect of fiscal rules on sovereign risk, is then not necessarily the result of markets yearning for budget cuts or showing an appreciation for strict fiscal frameworks, but driven by a common underlying factor. For pre-2009 studies, one candidate may be investor outlook on the probability of a country making it into the Eurozone. For the post-2009 studies, particular attention must be given to financial assistance and the political agreement of EU leaders. Bergman *et al.* (2013) analyse the determinants of changes in CDS spreads and find that announcements of austerity plans reduced the CDS spreads in Portugal, Ireland, Italy, Greece and Spain. It is however not clear whether this reduction is due to markets being in favour of budget cuts or if it simply reflects the fact that for three of these five countries fiscal consolidation was made a condition for EU financial assistance – to which markets were responding. Similarly, the ratification of the Fiscal Compact might have been welcomed by market participants not because they hope for domestic debt brakes, but because it is a prerequisite to be eligible for future bail-out funding through the newly created European Stability Mechanism. Market sentiment might also be shaped by perceptions of division among EU (and in particular Eurozone) member states. Therefore, efforts to minimize divisiveness – as with the adoption of similar debt break rules into national legislation – may bring down bond yields.

The current literature fails to pay sufficient attention to the issue of omitted variable bias. Feld *et al.* (2013) briefly discuss whether the omission of voters' or legislatures' preferences creates endogeneity. This concern is brushed aside pointing at cantonal dummies within the model, which are thought to control for these 'cultural factors or long-term preferences of the citizens in the cantons' (ibid. 21). Similarly, Heinemann *et al.* (2014) are concerned with the impact of



‘fiscal preferences’ for which they control with a host of variables. Hallerberg and Wolff (2005) as well as Heinemann *et al.* (2014) include a dummy measuring Eurozone membership in their models. Yet an ‘in-or-out’ measurement of Eurozone membership is unlikely to fully capture correlations between an improvement of fiscal rules and a perceived reduction in sovereign risk by financial market participants linked to monetary integration. Whereas Hallerberg and Wolff (2005) as well as Wolff and Iara (2009) consider a sample of (future) Eurozone members only, Heinemann *et al.* (2014) include three non-EMU member states (Sweden, United Kingdom and Denmark) in their sample. This is a promising approach to explore variation and capture any ‘EMU effect’, yet it is likely that the seemingly arbitrary selection of three outsiders is not ideal (see Section 5). Specifically the characteristics of these three euro-outsiders are not reasonably comparable, which makes them a potentially problematic counterfactual of the treatment group. Our scepticism is confirmed by their finding that EMU membership leads to an increase in bond yields, which clearly contradicts existing studies on EMU membership and bond yields (Bernoth *et al.* 2004).

### 3.2. *Simultaneity*

A second potential source of endogeneity stems from the likelihood that bond yields have an impact on fiscal institutions and not the other way round, raising concerns about reverse causality/simultaneity. Debates on the Fiscal Compact were clearly driven by the escalating Eurozone Debt Crisis. The Austrian government’s endorsement of national debt brakes indicates the reverse causality from fiscal outcomes and the threat of soaring yields to fiscal rules. Josef Pröll, Austria’s finance minister, argued that ‘considering the high indebtedness in Europe, [the Austrian government is] in favour of a *Schuldenbremse*’ (*Die Welt* 04.05.2010). There is evidence that the majority of EU Member States have, at least on paper, improved their budgetary institutions. According to information provided in the 2009-2010 Stability and

Convergence Programme, 21 EU Member States had implemented and/or planned to implement changes in their respective system of fiscal rules (Ayuso-i-Casals 2010). The European Commission's FRI (European Commission 2012) indicates a jump from an average of .30 in 2009 to .58 in 2010. The phenomenon is not restricted to EU Member States. Schaechter *et al.* (2012) provide an extensive survey of the adoption of new fiscal rules in 81 developed and developing countries in response to the Great Recession. Whereas in 1990, only five countries had fiscal rules in place, the number of countries with national and/or supranational fiscal rules surged to 76 by March 2012. These developments suggest to us that fiscal rules may well be influenced by pressures from the sovereign bond market, instead of the other way round.

Hallerberg and Wolff (2008) argue that 'it is unlikely that countries change their institutions because of risk premia in government markets'. Along similar lines, Iara and Wolff (2010: 281) claim that their 'research benefits from the advantage that the fiscal rules can be considered exogenous or predetermined to government bond yields' in the time period of their sample. Yet this may be the case already prior to 2008 — a possibility which none of the four papers reviewed acknowledges. Our assumption corresponds to findings in the literature on fiscal rules and budgetary outcomes where reversed causality is recognised. Haan *et al.* (1999), for example, present evidence suggesting that in several European countries, budget rules emerge as a result of fiscal outcomes. There is no reason why market discipline could not have encouraged governments before this date not only to consolidate public finances, but also to reform domestic fiscal institutions. Especially where unfavourable borrowing conditions coincided with a reprimand from the European Commission to improve domestic fiscal frameworks, the change in fiscal rules cannot be considered exogenous. Already in the run-up to the launch of the single currency in 1999, simultaneity may be an issue. One of the five Maastricht criteria related to long-term interest rates. Here candidates, particularly where sovereign risk was considered high by market participants, had a strong incentive to improve

their fiscal framework as a means to qualify for membership. A similar mechanism may have been at work for second- and third-wave Eurozone Member States.

### *3.3. Addressing endogeneity*

Although endogeneity is a serious problem, there is no shortfall of potentially fruitful remedies. A well-established solution for dealing with endogenous explanatory variables can be found in instrumental variable approaches, which make it relatively straightforward to test for and, if necessary, to control for reversed causality. A related useful avenue for future research would be to explicitly model the bi-directionality of fiscal rules and bond yields using a simultaneous-equation model (Zellner and Theil 1962). Regarding the issue of omitted variable bias, possible solutions require a broadening of model specifications. EU/Eurozone membership can be captured with simple country dummies. Defining this dummy, future studies should move beyond official ‘joining EMU dates’. Given the convergence of applicant member states bond yields prior to 1999, it seems likely that market participant already reacted positively to the prospect of joining EMU (Gray 2013). For research interested in the impact of fiscal rules post 2009, one of the challenges will be find appropriate measurements to filter the effect of fiscal rules from that of other ‘political noise’ such as qualifying for a bailout. Furthermore qualitative research methods, such as process tracing, can yield valuable insight (George and Bennett 2005). In his account of EU budget reform in the late twentieth century, Hallerberg (2004) charts the development of fiscal institutions relying on in-depth interviews and documentary analysis. Although his analysis is concerned with the link between fiscal governance and fiscal outcomes this type of nuanced process tracing is well suited to address both issues of simultaneity and omitted variable bias. Furthermore, interviews with financial market participants, despite its challenges (see McKenzie 2006: 570), can help us to shed light onto whether or not investors care about the strength, application and type of fiscal rule that

countries adopt. Interviews can also touch upon the contextual nature of fiscal rules; are rules viewed differently in times of financial crises or for countries with a very strong/weak sovereign risk evaluation?

#### **4. Measuring fiscal rules**

Modelling the relationship of bond yields and fiscal rules throws up the challenge of effectively capturing the rules in question. Researchers across the social sciences have undertaken a plethora of efforts to put the measurement of fiscal rules on a firm footing. Yet there is not one final answer as to which approach provides the most appropriate framework for such analyses. Particular attention should be paid to the distinction between rules on paper and in reality. The approach in the fiscal rules literature ranges from binary dummies to a more complex weighted multi-indicator variable. Two of the four studies reviewed rely on the European Commission's FRI. Feld *et al.* (2013) create a similar index (relying on fewer categories) for sub-state rules in Switzerland. Hallerberg and Wolff (2008) create an index that accounts for the 'institutional fit' of the fiscal governance framework in place looking at both the strength of the finance minister/parliament and of fiscal targets. In practice, all measures are either, as in a few cases, time-invariant or in most cases change little over time. Methodologically all four studies rely on panel fixed effects (see Plümper *et al.* 2005). Yet countries where fiscal rules are varying little or not at all will not enter the fiscal rules estimates in a specification with fixed country effects, which remove all cross-sectional variation. Only Heinemann *et al.* (2014) address this problem explicitly and use fixed effects vector decomposition (FEVD) estimates (see Plümper and Troeger 2007).

#### *4.1. De facto and de jure fiscal rules*

Common measurements, the Commission's index included, predominantly focus only on the *de jure* aspect of fiscal rules, while excluding the reality of fiscal frameworks. An index is usually able to capture which rules exist on paper, but this tells us little about whether fiscal rules are actually respected. Whereas there is empirical research on markets' reaction to the violation of EU-level fiscal rules (Afonso and Strauch 2004), we lack similar evidence for domestic fiscal frameworks. As Iara and Wolff (2010: 10) concede '[the index] only considers if there is a numerical constraint to a budgetary aggregate: it does not take into account however if this constraint is realistically binding in reality'. Yet there is reason to believe that compliance matters (cf. Nelson 2010), particularly as non-compliance is endemic. Recent estimates of 11 EU member states from 1990-2014 suggest that countries tend to comply with their fiscal rules only in about 50% of the years (Reuter 2015).

As none of the four studies addresses compliance, there is also no distinction between 'justified' and 'unjustified' non-compliance. Specifically, high scores on the fiscal rules index may be relatively meaningless when rules do not fully apply due to escape clauses. The (common) exceptionality provisions of fiscal rules are considered in the Commission's questionnaires, which have 'exclusions from the coverage of the rule' as one criterion. But the random weighting of the rule does not change if escape is sought. The absence of exceptionality clauses does not necessarily mean that policy-makers are bound to the (too) restrictive fiscal rules of better times. In the UK, for example, existing rules were put on hold during the Great Recession. This suspension is reflected in the largest drop in the fiscal rules index since the start of the recording in 1990 for all Member States (from a score of 2.06 in 2008 to -1.02 in 2009). Schick (2010: 3) identifies a broader trend here, noting that in many OECD countries 'fiscal rules have been vitiated, at least temporarily, by the global economic crisis'. In its current form,

the Commission's FRI does not account for the political reality of applying, bending or outright violating fiscal frameworks.

#### *4.2. Addressing measurement challenges*

Moving forward, more nuanced fiscal rules indicators are needed to test whether bond markets react to the strength of a given budgetary constraint on paper or in reality. Constructing such indices, albeit time-consuming, is feasible. This is evident in the recent literature. Cordes *et al.* (2015), for instance, create a dummy that measures compliance with expenditure rules in 29 advanced and emerging economies between 1985 and 2013 in their analysis on the link between fiscal rules and fiscal outcomes. Reuter (2015) investigates the effects of (non-)compliance with national numerical fiscal rules on fiscal policy in 11 EU member states from 1990-2013. Indeed the European Commission's DG Ecfm is planning to work on improving the FRI methodology to better account for the efficacy of national budgetary frameworks. Proposals are expected to be available at the end of 2015 with a view to implementation in 2016. Indices that are able to consider both *de facto* and *de jure* dimension of fiscal rules have furthermore the advantage of showing greater variation, thus reducing the problems associated with existing composite indices, which are largely time invariant. Where studies continue to rely on fiscal rule indices that are likely to run into the 'invariant or slow-changing variable' problem, researchers should address this issue explicitly. Although there is no consensus in the literature as to the appropriate econometric remedy (Breusch et al. 2011), there is no shortage of potential solutions such as FEVD, within-between random-effects (Bell and Jones 2015), or a Hausman-Taylor estimator (Hausman and Taylor 1981).

## 5. Context-conditionality

The impact of fiscal rules on sovereign risk is inherently context-conditional rather than being of fixed magnitude and fixed content. Complex, context-conditional hypotheses are now the hallmark of empirical comparative politics; the effect of X (fiscal rules) on Y (sovereign risk) *depends on* Z (evaluation practices, liquidity, politics, etc.): formally,  $dY/dX=f(Z)$ . However, current empirical work, such as described above, does not sufficiently reflect the context-conditionality of underlying arguments. We will briefly address three concerns related to the context-conditionality of the study of fiscal rules.

### 5.1. One rule to bind them?

Prior to the outbreak of the global financial crisis, there were a diversity of fiscal rules and debate among both policy making officials and academics as to which kind of rules (if any) were most effective in achieving results (fiscal consolidation and the reduction of sovereign debt yields). Hallerberg *et al.* (2009) argue that the suitability of fiscal frameworks hinges on the prevailing type of government in a given country. Single majority governments should have a different type of fiscal framework than coalition governments. Hallerberg and Wolff (2008) present supporting evidence for this argument and show that fiscal rules lead to lower risk premia, but only if those rules ‘fit’ the political system of a country. The other three studies reviewed rely on composite indicators that take neither the ‘institutional level of fit’ into account nor distinguish between different types of rules such as budget balance rules, expenditure rules and debt rules which are likely to have dissimilar effects (cf. Tapsoba 2012). The push for sterner fiscal frameworks in the aftermath of the Great Recession has singled-out the German debt brake as a model to emulate. We lack empirical evidence as to whether debt brakes are actually superior instruments in achieving fiscal consolidation and/or improving

borrowing conditions. Without further analysis, it would be unfounded to cite Germany's post-crisis fiscal position and low sovereign risk as clear evidence for the success of debt brakes in bringing about either outcome.

## 5.2. Sample selection

All studies reviewed involve the setting of, at least, two parameters: time and space. Which country to include in the empirical analysis, which country to exclude? What is the appropriate time-span of the analysis? The first question is often not adequately addressed. Heinemann *et al.* (2014), for example, pick 16 EU Member States without discussing their selection criteria. Yet it is likely that the effects of fiscal rules on sovereign risk are contextual and may well differ across countries. Further analysis is needed that disentangles the characteristics of different country groups, such as EU/EMU membership or credit groups used by financial market investors to analyse the contextual features of fiscal rules (see Brooks *et al.* 2013). On a related note, the generalisability of findings so far can be put into question. What does the alleged impact of fiscal rules in 9 or 16 E(M)U Member State tell us about the need for reformed fiscal frameworks in the EU28, as pushed by the Fiscal Compact, to bring down sovereign bond yields? In their analysis of the impact of fiscal rules on cantonal bond yields, Feld *et al.* (2013: 2) argue that the 'Swiss system serves as a perfect laboratory' due to its system of fiscal federalism. If that is the case, then it still remains that the Swiss experience, a country with a unique sovereign risk structure, is hardly relatable to EU Member States. More attention should also be paid to the role of potential outliers. Outliers in data sets can have large effects, especially in small samples. Greece, for instance, was the only country of the 9 Member States examined by Iara and Wolff (2010) that, according to the European Commission, had no domestic fiscal rule in place. With only 9 countries under scrutiny, it is unclear if and how the inclusion of Greece impacts on the results.



The second issue relates to the question of whether the alleged fiscal rules – market behaviour link holds in crisis and non-crisis times alike. Generally speaking, the fiscal rules literature analysing fiscal outcomes is aware of problems linked to identifying a suitable timeframe for empirical analyses (although see Bergmann *et al.* 2013). Recent studies clearly identify a major structural break in both the determinants of fiscal policy outcomes and the drivers of yield spreads with the eruption of the global financial crisis in 2008 (Bernoth and Erdogan 2012). Of all four studies on fiscal rules and financial markets discussed, only Iara and Wolff (2010) include the Great Recession year 2009 in their analysis. As a robustness check the authors estimated their model with 2009 observations excluded. Even though this leads to a drop in only 10 observations ( $N = 97$  vs.  $N = 107$ ) the results are different.

Beyond the problem of appropriate time samples, the crisis-induced structural break further points to a so-far unresolved question: how much does the impact of fiscal rules pre-crisis tell us about the impact of fiscal rules during a crisis, in its immediate aftermath and beyond? We know that sovereign bond yields are influenced by both pull (domestic) and push (global) factors (de Grauwe and Ji 2012). This suggests that the impact of fiscal rules on sovereign risk premia, if it exists, is not constant but contingent on (inter alia) the financial risk climate. Iara and Wolff (2010) indeed present evidence that fiscal rules become relevant with a rise in investors' risk aversion. Politics, be it the perceived politics of bail-out prior to 2009 or the ECB's non-standard monetary policy measures, have shaped and continue to shape market behaviour. Further analysis is needed to account for non-linear, context-conditional effects.

### 5.3. Addressing context-conditionality

Common to most studies on fiscal rules and financial markets is a lack of rigorous empirical testing, which makes it hard to assess the explanatory validity of each of the models presented. At a minimum, future studies need to discuss the justification of sampling both regarding space and time. Particularly for analyses over a longer period of time, researchers are not in a position to confidently predict the incidence of structural breaks beyond established (crisis) points. It is useful and straightforward to test for these with a modified Chow test also known as Quandt likelihood ratio statistic. Given larger data availability as years go by, future research will be in a better position to compare the effects of fiscal rules post and pre debt crisis. In addition the context-conditionality of fiscal rules can be tested with interaction terms similar to those used in Iara and Wolff (2010), whereby the fiscal rule measurement is interacted with a measure of domestic (e.g. sovereign debt) or international (e.g. the VIX<sup>i</sup>) risk. Regarding the country selection more attention needs to be given to the role of potential outliers. It should be standard practice to, at least informally, identify outliers and to re-estimate models with the suspected outliers excluded. Data availability should not be an issue. The European Commission's FRI is available for *all* 28 EU Member States from 1990-2013. Furthermore, the IMF's Fiscal Rules Dataset<sup>ii</sup> provides information on the use and design of fiscal rules covering 89 countries from 1985 to 2014. The scope of the IMF's dataset has the advantage of providing potential control groups to formally test how for example EU/Eurozone membership conditions the impact of fiscal rules on sovereign bonds. Undertaking a large(r)-N project would allow us to better judge the extent to which the findings reported in these comparably small-N studies are representative. Within large(r)-N studies difference-in-difference analysis, which is widely used in econometric and experimental analyses, would also be a fruitful avenue to tease out context-conditional effects.

## 6. Conclusion

Within the current academic and political debate on fiscal rules much is assumed, whereas little is known. The alleged preference of financial market participants for stricter fiscal rules is based on a hand-full of articles whose generalisability and validity can be questioned. Moving forward this review of the literature suggests an emerging research agenda. The fiscal rules literature can be strengthened by paying greater attention to a) the endogeneity of fiscal rules, b) the distinction of *de jure* and *de facto* fiscal rules, and c) the context-conditionality of fiscal rules. Methodological triangulation, that is the combination of different methods, may resolve problems that cannot be tackled in studies that rely on only one method. As argued above, social scientists have a rich methodological toolkit at their disposal to advance the literature. Given the pressing challenges of debt sustainability in the developed and developing world, more and better empirical evidence on the relationship between fiscal rules and financial market behaviour is wanted.

## **Acknowledgements**

My thanks go to David Howarth who encouraged me to write this piece as well as three anonymous reviewers for their helpful suggestions. The research leading to this article has received funding from the European Research Council under the European Union's Seventh Framework Programme (FP7/2007-2013)/ ERC grant agreement no. 291733

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*Address for correspondence: Charlotte Rommerskirchen, School of Social and Political Science, University of Edinburgh, Chrystal Macmillan Building, 15a George Square, Edinburgh EH8 9LL, Scotland, UK. Email: [charlotte.rommerskirchen@ed.ac.uk](mailto:charlotte.rommerskirchen@ed.ac.uk)*

## Notes

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<sup>i</sup> The VIX is the Chicago Board Options Exchange Market Volatility Index. It is one of the most prominent measurements for international investors' appetite for risk.

<sup>ii</sup> <http://www.imf.org/external/datamapper/fiscalrules/map/map.htm>